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ABSTRACT

Introducing students to different hawks and owls found in Wisconsin and building a basis for appreciation of these birds in their own environment is the purpose of this teacher's guide. Primarily geared for upper elementary and junior high grades, the concepts presented could be used in conjunction with the study of ecology. A filmstrip is employed to increase the student's knowledge and understanding of the essential role of these animals. A crucial point emphasized is the necessity for proper habitat in order for the birds of prey to survive, for if this habitat is changed or destroyed, the birds will be eliminated. Additional topics include bird characteristics, food requirements, life cycles, value of the birds in a natural community, and effects of man. The filmstrip is explained in its entirety, illustrating each frame and its accompanying script. Bracketed paragraphs provide the teacher with additional information. Also included are charts showing birds of prey found in Wisconsin, build-up of DDT residues in osprey eggs, abundance of breeding animals in a square mile, and resource materials. Two magazine articles about bald eagles and peregrine falcons are reproduced. The filmstrip is not included. This work was prepared under an ESEA Title III contract. (BL)

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BIRDS OF PREY

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Instructional Materials About Our Community

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The Instructional Materials Center

Madison Public Schools

Madison, Wisconsin

"BIRDS OF PREY"

Section I: Information for the Teacher

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Section II: Script for Filmstrip

"BIRDS OF PREY" . . . . . Page 9

The filmstrip and guidebook were produced by the Instructional Materials Center, Madison Public Schools, Administration Building, 545 West Dayton Street, Madison, Wisconsin 53703.

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Objectives

It is the purpose of this set to introduce students to different hawks and owls found in Wisconsin and to build a basis for appreciation of these birds in their own environment.

Many of our birds of prey, as well as other predators, are in a precarious position today because of man's lack of knowledge and understanding of the essential role of these animals.

A crucial point which should be emphasized is the necessity for proper habitat in order for the bird to survive. If this habitat is changed or destroyed, the bird will be eliminated.

Basic Outline

1. Characteristics of birds of prey
    a. Structures
    b. Food
2. Habitat requirements
3. Food pyramid
4. Life cycles
    a. Great horned owl
    b. Red-tailed hawk
5. Value of the birds in a natural community
6. Effects of man

Suggested Uses

The slides and script are primarily geared for upper elementary grades and middle school. The concepts presented could be used in connection with study of ecology — the interrelations of plants and animals.

Additional information on the hawks and owls in the filmstrip.

Hawks:

1. Red-tailed hawk

broad, rounded wings, fan shaped tail
female slightly larger than male
wing spread is 4 or more feet
food: mice (primary source), rabbits, squirrels, reptiles, small birds
wide distribution in U.S.
a permanent resident in Wisconsin

2. Sparrow hawk or Kestrel

narrow pointed wings and long tail
distinct facial pattern
female larger than male
almost a 2 foot wing spread
nests in artificial or natural cavities (hole in a tree, bird house, nook of a building)
food: grasshoppers and other insects (primary sources), rodents
has the habit of hovering over prey
distribution — open field and meadows
tends to migrate south, but a few will remain in Wisconsin during the winter

Owls:

1. Great horned owl

largest common owl in U.S.
4 foot or more wing spread
prominent "ear" tufts
white throat patch
powerful and aggressive predator
food: cottontail rabbit (primary source), squirrels, mice and rats, birds, snakes, weasels, skunks, porcupines (!)
distribution — forests and swamps
permanent resident in Wisconsin

2. Saw-whet owl

smallest eastern nocturnal owl, little larger than a robin
long broad wings
nests in natural or man-made cavities
food: mice and other small mammals
distribution — coniferous forests
an erratic winter migrant from the north

Birds of Prey Found in Wisconsin

Hawks:

1. Red-tailed hawk
2. Red-shouldered hawk
3. Broad-winged hawk
4. Rough-legged hawk
*5. Swainson's hawk
*6. Ferruginous hawk
7. Goshawk
8. Sharp-shinned hawk
9. Cooper's hawk
10. Osprey
*11. Gyrfalcon
*12. Peregrine falcon
13. Pigeon hawk
14. Sparrow hawk
15. Marsh hawk

Owls:

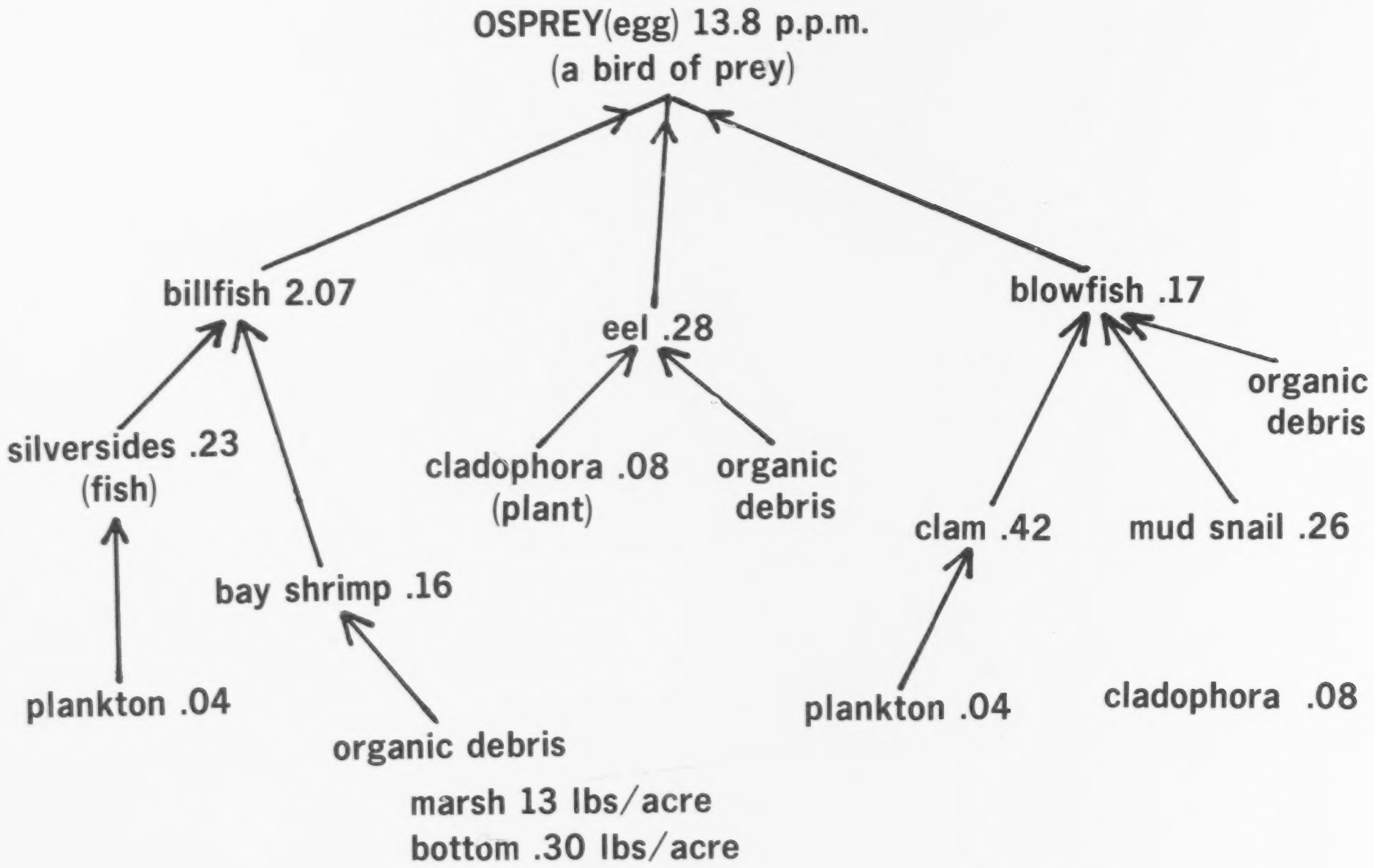
1. Barn owl
2. Great horned owl
3. Snowy owl
4. Burrowing owl
5. Barred owl
6. Long-eared owl
7. Short-eared owl
8. Saw-whet owl
*9. Boreal owl
*10. Hawk owl

Eagles:

1. Bald eagle
2. Golden eagle

* denotes rare to very rare

Build-up of DDT residues



Resource Material

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Magazines

1. Audubon magazine (National Audubon Society) Vol. 70 #5 Sept.-Oct, 1968.
"The Hunting Hawk" by L. Brown and D. Amadon.

2. National Geographic Vol. 136 #1 July, 1969.
"The Endangered Osprey" by R. T. Peterson.

3. Scientific American 216 (3): 24-31.
"Toxic Substances and Ecological Cycles" by G. Woodwell.

Books

1. Austing, G. R. and Holt, Jr., J.B. The World of the Great Horned Owl. J. B. Lippincott Co., Philadelphia and New York, 1966.

2. Austing, G. R. and Holt, Jr., J.B. The World of the Red-tailed Hawk. J. B. Lippincott Co., Philadelphia and New York, 1964.

3. Broley, M. J. Eagle Man. Pellegrini and Cudahy Publishers, New York, 1952.

4. Russell, F. Hawk in the Sky. Holt, Rinehart and Winston, New York, 1965.

Visual aids — available from Madison Public Schools IMC

Filmstrips — Owls and Hawks; from filmstrip series "Birds You Should Know"
Produced by National Film Board of Canada.
— Classification of Living Birds; from filmstrip series "Birds of Prey"
Produced by Encyclopedia Britannica.

Film loops (Super Eight) — Osprey — Bird of Prey;
Produced by Walt Disney.

Film — Nature's Birds of Prey, Instructional Materials Center, 3374 film library, Madison Public Schools.

Source: Wisconsin State Journal

Audubon Director Reports:

Bald Eagle Nears Extinction, Thanks To Pesticide Use

By STANLEY M. BROWN

EVERGLADES PARK, Fla. (UPI) — The bald eagle, symbol of America's majesty and might, is eating itself toward extinction.

It isn't a high cholesterol count that is slowly killing off the magnificent bird that Ben Franklin, Thomas Jefferson and John Adams made the focal point of the Great Seal of the United States in 1782.

"Unless we take steps to prevent it, pesticides — DDT in particular — will eventually eradicate the bald eagle," predicts Alexander Sprunt IV, the research director of the National Audubon Society.

Florida and Alaska are the last two strongholds of the bald eagle in the United States. Because of Alaska's "superfavorable," habitat, the bald eagle is in no immediate danger of extinction there.

Such is not the case in Florida, where the bald eagle population is now estimated at 200-250 pairs and is still declining. In 1966, Florida had over 300 pairs of bald eagles.

"The two coastal areas are in great danger," Sprunt said, "because their reproduction rate is way down—less than 30 per cent. They are barely holding their own in the Lake Okeechobee to Orlando area.

"The Everglades National Park has the healthiest bald eagle population in the United States, except possibly southeast Alaska," Sprunt said.

Bald Eagle

There are about 55 pairs of bald eagles in the Everglades National Park, according to park naturalist William Robertson. He estimates their reproduction rate is "close to 60 per cent."

To maintain a stable population, Sprunt said eagles must have a reproduction rate of 50 per cent. "This means that half the nests must produce an eaglet each year."

Sprunt said there are four major factors pushing the bald eagle toward extinction.

Sprunt said pesticide pollution and the shooting of eagles by unknowing or uncaring persons are the most serious. The other two causes are habitat destruction and human population pressure.

Source: Wisconsin State Journal

Greatest Flyer Faces Extinction

By BILL STOKES
(State Journal Outdoor Writer)

The peregrine falcon, the greatest flyer to grace the skies of Wisconsin, has been gone from the state for a dozen years, and now there is concern that the fastest of all winged creatures may be taking its final North American curtain call.

The peregrine, also called the duck hawk, is the latest nominee to the Department of the Interior's list of "endangered species." The purpose of placing the bird on the list is to notify the public that special protection is required if the high-speed predator is to survive.

THERE WAS a day when the peregrine nested in Wisconsin — in Dane County at Ferry Bluff, along the Mississippi River bluffs, and on the rock cliffs along Lake Michigan.

N. R. Barger, wildlife biologist with the Conservation Division, said that the last nest in the Ferry Bluff area was destroyed by egg collectors about 18 years ago.

The peregrine is prized by falconers for its speed and ability in "stooping" from great heights and bagging other birds in flight. Prior to tighter protection controls, it was common for persons providing birds to falconers to rob peregrine nests.

RESEARCHERS with the Bureau of Sport Fisheries and Wildlife say that the peregrine falcon, like the bald eagle, is probably a victim of pesticides, urban growth, nesting site disturbance, noise and air pollution.

Barger, who is one of the state's most knowledgeable "birders," said, "**The last peregrine I saw in Wisconsin was 12 years ago in the Ferry Bluff area. Fifteen or so years ago, it was not uncommon to see them in Dane County.**

"The peregrine once migrated through Wisconsin in the fall and spring and was commonly sighted from the end of March through mid-May and again in September and October. We are not seeing these migratory birds in recent years."

THE PEREGRINE is slightly larger than a pigeon. Adults are dark, bluish-slate barred with black on the back, and creamy buff barred with black below. The cheeks are also black.

It nests in remote cliff areas, the female laying a clutch of six maroon eggs. The young mature in two years.

ABUNDANCE OF BREEDING ANIMALS ON 1 SQUARE MILE
(Source: Santa Rita Range Reserve, Arizona. Leopold, 1933)

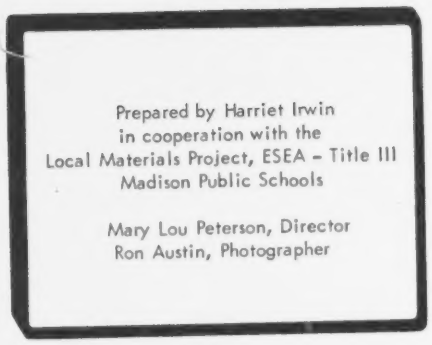
Coyote	1
Great horned owl	2
Red-tailed hawk	2
Blacktail rabbit	10
Hognosed and spotted skunk	15
Roadrunner	20
Cattle (over 1 year old)	25
Scaled quail	25
Cottontail	25
Allen's jackrabbit	45
Gambel quail	75
Kangaroo rat	1,300
Wood rat	6,400
Mice and other rodents	18,000

1
Colophon

2
Title Frame

SPECIAL NOTE:

Please do not judge the quality of the beautiful full-color pictures in the filmstrip by the appearance of the black-and-white photos in this guide! Obviously, there is no comparison between full-color and black and white pictures.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Madison Public Schools
Mary Lou Peterson, Director
Ron Austin, Photographer

3
Credit Frame
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Mary Lou Peterson, Director
Ron Austin, Photographer

4
Among the most magnificent birds in North America are hawks, owls, and eagles — the birds of prey.

[A list of hawks, owls, and eagles found in Wisconsin is included.]

5
Birds of prey differ in size, shape and requirements for habitat. (Picture: Saw-whet owl)

[Habitat: an area where an animal lives.]

6

Because these birds are predators, and eat other animals, they are equipped for hunting. (Picture: Sparrow hawk)

[Predator: an animal whose food consists of other animals.
Prey: an animal which is taken by a predator as food.]

7

Depending on the size of the hunter, the prey may include rabbits, squirrels, small birds, frogs, snakes or insects; but by far the most important prey are mice and other rodents. (Picture: Great horned owl)

8

Predators rely on powerful, sharp-clawed feet for seizing and killing the prey . . .

9

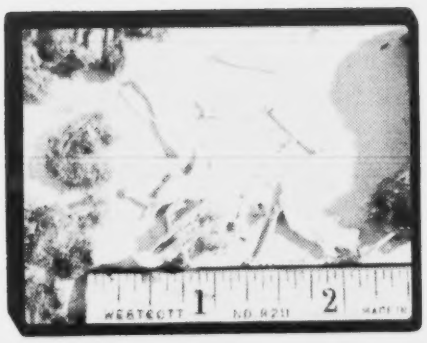
. . . and hooked beaks for tearing and ripping.

10

Talons and beaks enable the predatory birds to play a vital role in nature. Birds of prey feed upon smaller animals and keep them from overpopulating an area and destroying the vegetation.

11
After capturing the prey, owls eat the whole animal. The mass of undigested hair and bones is stored in the crop and then regurgitated. The bones found in such regurgitated owl pellets are an important way to identify the food source. Hawks cast up pellets also, but less frequently than owls, for many of the undigestible parts — hair of mammals, wings of insects, feathers of birds — are removed before the prey is eaten. This is often done at a "plucking post".

[In winter, pine groves or plantations in the country are likely areas to look for the hard dry pellets of owls.]



12
Contained in one owl pellet were the skull and bones of a meadow mouse, a good food source because of its abundance.

[See teacher note, frame 21]

13
Through evolution the predator species have developed skills in hunting . . .

14
. . . while the prey species have developed techniques for escaping the predators.

[Examples of techniques:
Camouflage, sharp senses, eyes placed on the sides of the head so the animal has a large field of vision.
Be sure to notice the rabbit under the shrubs.]

15
Most birds of prey hunt from a perch — a commanding branch, pole or rocky crag — and survey the surrounding landscape for food.

16
Hawks are diurnal and hunt primarily by sight — a highly developed sense. Some hawks have eyes up to eight times as powerful as human eyes.

[Diurnal: active during the day.]

17
Owls, on the other hand, hunt more by sound because they are nocturnal. Acute hearing helps locate the prey. In addition, the feathers of the wings are constructed to allow the owl to fly silently.

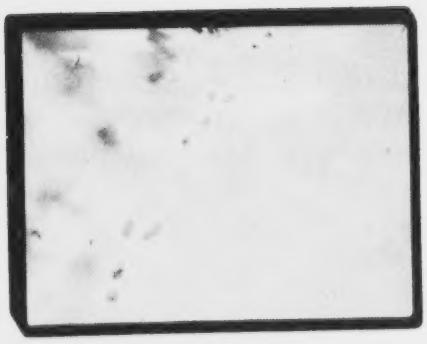
[Nocturnal: active at night. Most owls hunt at night using a highly developed sense of hearing. Large unevenly-shaped ear cavities receive sound waves through elongated, external slits from eye to throat. This structure provides acute hearing and unerring ability to locate prey in darkness. For further information see: Audubon Nature Bulletins, National Audubon Society, 1130 Fifth Avenue, New York, New York.]

18
Data available now indicates that unsuccessful attacks on prey are more frequent than successful ones.

19
Habitat for birds of prey may include open country, dense forest, marsh, or swamp but it will always be a place which meets the bird's requirements: food, water, cover, places to loaf, and a breeding site. Areas not too heavily populated are essential if a bird of prey is to survive.

20
Here the pines provide cover and winter roosting sites for owls. They can find an adequate source of food in the open meadow. The farmer who owns this land appreciates the value of owls in keeping down the population of mice and other rodents. How could you tell whether owls are using such an area?

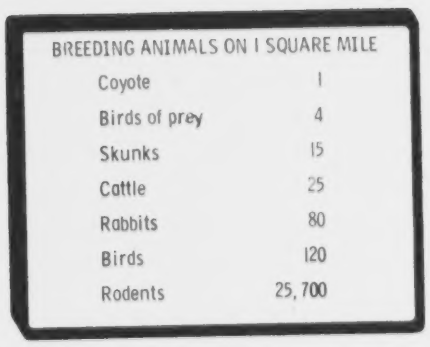
 [See teacher's note, frame 11]



21

Signs of the prey species are abundant in the meadow. Mice and other prey are prolific breeders and would over-populate an area if not held in check by the predator.

[Reproductive potential of prey species:
meadow mouse — breeds throughout the year, 6-7 young per litter. Female mates immediately after birth of one litter. Young mature in three weeks.
gray squirrel — 2 litters per year, 3-4 young per litter.
rabbit — 2-3 litters per year, 3-6 young per litter.]



22

This chart is from a study made in Arizona. In spite of the large number of prey species, one square mile was enough to support only five predatory animals. Consider that each rodent needs a certain amount of vegetation to survive. Can you imagine how much vegetation would be needed to support 25,700 rodents?

[The complete sheet of animal data is included in the packet. A copy may be made for each child.]

23

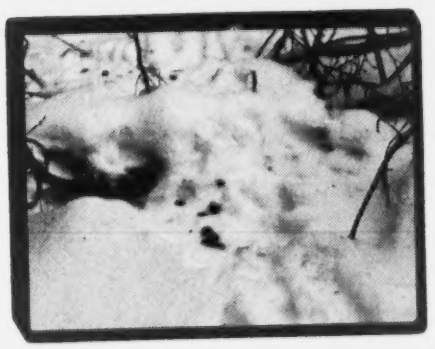
Large areas of dense forest and swamp are necessary for the nesting success of the great horned owl. On cold winter nights in January, it is possible to hear the low throaty hoots of the bird, announcing the start of the mating season.

[Aggressive and powerful, this owl is the largest common owl in the United States.]

24

In spite of the adverse weather, nesting begins in February, often in an old hawk or crow nest. A month or so later the young hatch — small, downy and helpless. They remain in the nest for the next six to seven weeks and cannot fly until they are ten to twelve weeks old.

25
Does it seem strange to you that the eggs are laid before winter is over? Most likely the eggs or young birds would freeze if left unprotected. What advantage is there to early nesting?



26
Consider the following points;

1) The adults provide food for the young for approximately three months after hatching. Prey is easier to find before the vegetation provides cover.
2) The prey species (squirrels and other rodents, rabbits, etc.) are most numerous in the early spring after the first litter is born.

What difference might these factors make to the owl?

(Picture: Rabbit and mouse tracks)

27
In this forested area of Iowa County in southern Wisconsin, a red-tailed hawk has established a territory.

28
In late February or early March a suitable site is located and nest building begins. Look for the nest in the pine to the right.

29
A flat, shallow nest is constructed from sticks and twigs, and lined with strips of bark, grass, and a few green sprigs of pine, cedar, or hemlock. Two or three eggs are laid and incubation occurs for about a month.

30

After hatching, the young birds remain in the nest for another four weeks. Both parents are kept busy feeding the fast growing offspring a diet of m i c e, rabbits, squirrels, reptiles and small birds.

31

By June the young are almost fully grown and ready to come off the nest. They look similar to the adults, but will not breed until they are two or more years old.

[A hawk raises only 2-3 offspring per year under optimum conditions. Contrast this to prey reproduction. See frame 21 teacher's note.]

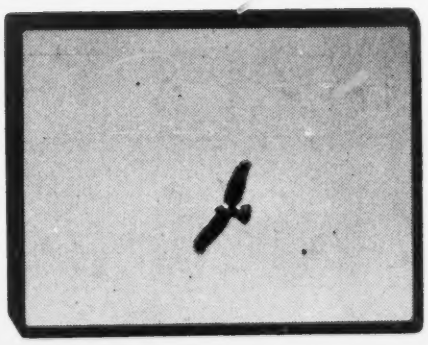
32

Once they leave the nest, they embark on a life which is hazardous at best. Very few reach maturity. Man's activities as well as his lack of understanding of the importance of predators, increase the hazards considerably.

33

Much of the birds' habitat is being destroyed in conversions to roads, subdivisions, shopping centers and other signs of civilization. In Wisconsin there are laws protecting the birds of prey, but if the habitat is destroyed, the birds cannot be saved. Which of the habitat requirements mentioned in frame 19 are met in an area such as this?

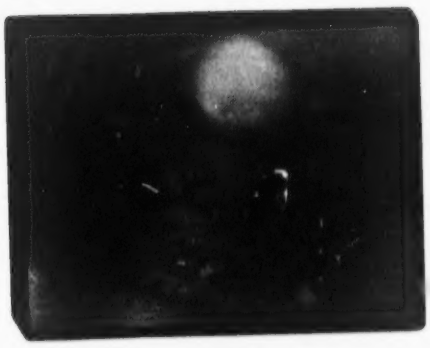
[Work in progress for west side shopping center.]



34

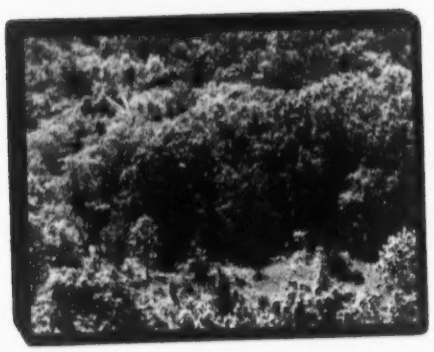
Another of man's activities which threatens these magnificent birds of prey is the use of pesticides. These chemicals, designed to kill insect pests, pervade the environment and accumulate in the bodies of predator species, interfering with reproduction.

[See: Woodwell, G.M. "Toxic Substances and Ecological Cycles" Scientific American. Vol. 216 (3) 24-31, March, 1967.]



35
Those who would protect these birds from extinction point to their value to man in controlling destructive prey species.

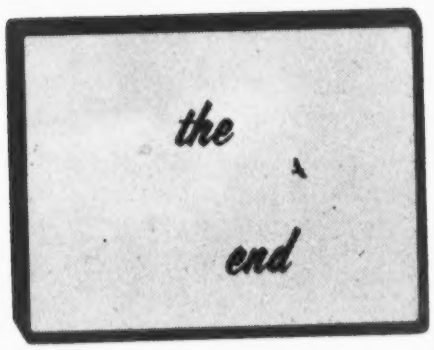
"But for those who love wild nature the bird of prey requires no special defense, no justification for existence.



36
An intense emotional satisfaction can be obtained from the sight of a great bird of prey in the full beauty of its natural haunts". (Audubon. Vol.70 No. 5 page 52, Sept. / Oct. 1968.)

Wild animals simply do not make good pets. They are necessary in nature and should not be removed from their habitat.

The soaring hawk is a red-tail.



37
The End.

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tends to migrate south, but a few will remain in Wisconsin during the winter

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smallest eastern nocturnal owls, little larger than a robin
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*9. Boreal owl
*10. Hawk owl

Eagles:

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2. Golden eagle

* denotes rare to very rare